SUPPORT FOR THE AMENDMENT

This Amendment cancels Claims 1-15; and adds new Claims 16-26. Support for the amendments is found in the specification and claims as originally filed. In particular, support for Claim 16 is found in canceled Claims 1 and 12 and in the specification at least at page 3, lines 2-3 ("the surface of the quartz glass substance is crystallized"). Support for Claim 17 is found in the specification at least at page 6, lines 6-7 ("porous"). Support for Claim 18 is found in canceled Claim 2 and in the specification at least at page 6, line 3 ("sinter"). Support for Claim 19 is found in canceled Claim 14 and in the specification at least at page 7, lines 2-4. Support for Claim 20 is found in canceled Claim 12. Support for Claims 21-23 is found in canceled Claim 13. Support for Claim 24 is found in the specification at least at page 13, line 4 ("coating"). Support for Claim 25 is found in canceled Claim 2. Support for Claim 26 is found in canceled Claims 12 and 15. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 16-26 will be pending in this application. Claim 16 is independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

Applicants thank the Examiner for the courtesies extended to their representative during the personal interview on January 13, 2006.

As discussed at the personal interview, conventional silica glass crucibles have a tendency to deform at the high temperatures required for pulling silicon single crystals from the crucibles. Specification at page 1, line 23.

To reduce the deformation, the present invention provides a reinforced silica substance (e.g., crucible) where a layer comprising crystalline quartz serves to reinforce a silica glass substance comprising amorphous silica.

Claims 12-14 are rejected under 35 U.S.C. §103(a) over U.S. Patent Application Publication No. 2002/0017114 A1 ("Fukui") in view of U.S. Patent No. 5,389,582 ("Loxley").

Fukui discloses a method for producing high purity amorphous synthetic quartz powder having a carbon content of less than 2 ppm and a hydroxyl group content of less than 50 ppm. Fukui at [0046]. Fukui discloses that the amorphous synthetic quartz powder can be used as raw material to form a quartz glass crucible having few trapped bubbles. Fukui at [0047]. Fukui discloses that a quartz glass crucible can be made with a transparent glass inner layer that has a bubble content of less than 0.1%. Fukui at [0047]. The term "glass" can be defined as "an amorphous, undercooled liquid of extremely high viscosity which has all the appearances of a solid". Hawley's Condensed Chemical Dictionary, 12th Edition, page 561 (copy attached).

However, Fukui fails to suggest the independent Claim 16 limitations of a reinforced silica substance comprising "a silica glass substance comprising amorphous silica; and a layer comprising crystalline quartz on the silica glass substance".

Loxley is cited for disclosing silica particles with an average particle size of 1-10 microns. Office Action at page 5, lines 3-6. However, Loxley fails to remedy the deficiencies of Fukui.

Because the cited prior art fails to suggest all the limitations of independent Claim 16, the rejection over Fukui in view of Loxley should be withdrawn.

Claims 12 and 13 are rejected under 35 U.S.C. §112, second paragraph, and Claim 12 is objected to. Claims 12-13 are canceled, so the rejection and objection are moot and should be withdrawn.

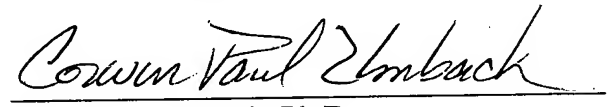
Pursuant to M.P.E.P. §821.04, after independent Claim 16 is allowed, Applicants respectfully request examination and allowance of new method Claims 24-26, which include all the limitations of independent Claim 16.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Corwin P. Umbach, Ph.D.
Registration No. 40,211

Attached:
Hawley's Condensed Chemical Dictionary, 12th Edition, page 561

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bon dioxide from the gas to be purified as it moves up the tower. The amine, contaminated with these products, is then sent from the bottom of the tower to a steam stripper where it flows countercurrent to steam, which strips the hydrogen sulfide or carbon dioxide from it. The amine is then returned to the top of the tower. The process is widely used in the petroleum industry for purifying refinery and natural gases and for recovery of hydrogen sulfide for sulfur manufacture. Removal of carbon dioxide from gases is usually done with monoethanolamine.

glacial. A term applied to a number of acids, e.g., acetic and phosphoric, which have a freezing point slightly below room temperature when in a highly pure state. For example, glacial acetic acid is 99.8% pure and crystallizes at 16.6C.

glance. A mineralogical term meaning brilliant or lustrous, used to describe hard, brittle materials that exhibit a bright reflecting surface when fractured. Examples of such materials are hard asphalts (glance pitch) and ores of certain metals such as lead glance (galena).

Glaser coupling. Coupling of terminal acetylenes by shaking an aqueous solution of cuprous chloride-ammonium chloride and the alkyne in an atmosphere of air or oxygen.

glass. A ceramic material consisting of a uniformly dispersed mixture of silica (sand) (75%), soda ash (20%), and lime (5%), often combined with such metallic oxides as those of calcium, lead, lithium, cerium, etc., depending on the specific properties desired. The blend (or "melt") is heated to fusion temperature (approximately 700–800C) and then gradually cooled (annealed) to a rigid, friable state, often referred to as vitreous. Technically, glass is an amorphous, undercooled liquid of extremely high viscosity which has all the appearances of a solid. It has almost 100% elastic recovery.
See also glass, optical.
Properties: (soda-lime glass) Lowest electrical conductivity of any common material (below 10^{-6} mho/cm). Low thermal conductivity. High tensile and structural strength. Relatively impermeable to gases. Inert to all chemicals except hydrofluoric, fluosilicic, and phosphoric acids and hot, strong alkaline solutions. Continuous highest-use temperature about 121C but may be higher, depending on composition. Good thermal insulator in fibrous form. Molten glass is extrudable into extremely fine filaments. Glass is almost opaque to UV radiation; in the absence of added colorant it transmits 95–98% of light to which it is exposed. Non-combustible.
Occurrence: Natural glass is rare but exists in the form of obsidian in areas of volcanic activity and meteor strikes. Excellent sand for glassmaking occurs in Virginia (James River), Pennsylvania, Massachusetts, New Jersey, West Virginia, Illinois, and Maryland; also in southern Germany and Czechoslovakia.
Available forms: Plate, sheet, fiber, filament, fabric, rods, tubing, pipe, powder, beads, flakes, hollow spheres. See also sodium silicate.
Hazard: TLV: fibers or dust 10 mg/m^3 of air.
Use: Windows, structural building blocks, chemical reaction equipment, pumps and piping, vacuum tubes, light bulbs, glass fibers, yarns and fabrics; containers, optical equipment. Minute glass spheres with partial vacuum interior and treated exterior are available for compounding with resins for use in deep-sea floats, potting compounds, and other composites.
See also following entries.

glass, borosilicate. See glass, heat-resistant.

glass-ceramic. A devitrified or crystallized form of glass whose properties can be made to vary over a wide range.
Properties: Rupture modulus up to 50,000 psi, d 2.5, thermal shock resistance 900C, continuous highest-use temperature 700C. Glass-ceramics lie between borosilicate glasses and fused silica in high-temperature capability.
Derivation: A standard glass formula to which a nucleating agent, such as titania, has been added is melted, rolled into sheet, and cooled. It is then heated to a temperature at which nucleation occurs, causing formation of crystals.
Use: Range and stove tops, laboratory bench tops, architectural panels, restaurant heating and warming equipment, telescope mirrors.
See also nucleation; "Pyroceram," "Cer-vit."

glass electrode. See electrode, glass.

glass enamel. A finely ground flux, basically lead borosilicate, intimately blended with colored ceramic pigments. Different grades give characteristics of acid resistance, alkali resistance, sulfide resistance, or low lead release to meet requirements for various uses. Firing range 540–760C.
Use: For fired-on labels and decorations on glassware, tumblers, milk bottles, beverage bottles, glass containers, illuminating ware, architectural glass, and signs.
See also porcelain enamel.

glass fiber. Generic name for a manufactured fiber in which the fiber-forming substance is glass (Federal Trade Commission). Non-combustible.
Properties: Tensile strength 15 g/denier, elongation 3–4%, d 2.54, no moisture regain; loses strength above 315C, softens approximately 815C.

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